

For the reasons discussed as follows, Applicant respectfully submits that all pending claims are allowable over the prior art reference applied in the Final Rejection, and respectfully requests that the prior art rejection of the claims be reconsidered and withdrawn.

At page 2, paragraph 3 of the Official Action, claims 1 – 7, 10 – 17, and 20 – 25 have been rejected under 35 U.S.C. Section 102(b) as being anticipated by, or in the alternative, have been rejected under 35 U.S.C. Section 103(a) as being obvious over, “Underground Drilling And Loading Handbook – Tamrock; Tamrock Corp. 1997 (Tamrock)”.

At page 4, paragraph 4 of the Official Action, claims 8 – 9 and 18 – 19 have been rejected under 35 U.S.C. Section 103(a) as being obvious over a combination of the Tamrock publication and the Hobhouse patent (U.S. Patent No. 3, 550, 697).

Claims 1 and 11 are the only independent claims pending in this patent application. Therefore, for the purpose of simplifying the issues, the prior art rejection of the claims will be argued only with respect to the independent claims. If these claims are allowed, the remaining rejected dependent claims will be allowable, at least for the same reasons as their respective parent independent claim.

As noted above, independent claims 1 and 11 have been rejected, either as being anticipated by, or obvious over, the Tamrock publication. Applicant initially notes that the Tamrock publication was first applied to reject the claims in the Final Action.

In any event, Applicant submits that the Tamrock publication, relied upon in the rejection of independent claims 1 and 11, fails to teach or suggest the method and system defined by these independent claims. The portions of the Tamrock publication relied upon the Examiner to reject independent claims 1 and 11 relate to the section entitled "Principles of Rock Drilling", and Applicant acknowledges that section 3.2 of the Tamrock publication discloses basic functions of percussion drilling. In particular, this portion of the Tamrock publication discloses percussion, rotation to index the drill bit, and flushing to remove cuttings and cool the drill bit. Accordingly, Applicant acknowledges that the Tamrock publication discloses a rock drilling apparatus which comprises a main power supply means for supplying power for the rock drilling process, which includes the sub-processes of flushing and at least one of percussion and rotation.

However, the Official Action also contends that the Tamrock publication discloses adjusting flush power directly in dependence on a value representing hole depth, referring to page 38, second paragraph of the Tamrock publication. Applicant respectfully disagrees with the Examiner's interpretation of this portion of the Tamrock publication.

At page 38 of the Tamrock publication, this reference discloses, in detail, the purpose of flushing and required flushing velocity. At page 38, first paragraph, the Tamrock publication states, in pertinent part, that: "The purpose of flushing is to remove rock cuttings from the drill hole and to cool the drill bit...".

Page 38, paragraph 2 of the Tamrock publication, relied upon by the Examiner in the Official Action, states, in pertinent part, that: "...The amount of flushing needed per unit of time to remove the cuttings from the drill hole is a function of the hole size, cuttings produced per time unit and hole length. ..."

The Official Action concludes, based upon the disclosure at page 38 of the Tamrock publication, that Tamrock discloses adjusting flush power directly in dependence on a value representing hole depth. Applicant respectfully disagrees with this conclusion, for the following reasons.

Although Tamrock discloses that the amount of flushing needed per unit of time to remove the cuttings from the drill hole is a function of the hole size, cuttings produced per unit time and hole length, this disclosure is completely different from adjusting flush power as a function of hole depth, as disclosed by Applicant and as expressly recited independent claims 1 and 11, as will be more fully explained below.

At page 38 of the Tamrock publication, Tamrock discloses a Table (Table 3-2) which lists required air volume/flow (m<sup>3</sup>/min) for various steel diameters and various hole sizes. Accordingly, Tamrock lists dimensioning parameters to be used in dependence of steel diameter and hole size being used. This data is used as dimensioning parameters when dimensioning, for example, the flush system (e.g., compressor size) of a drilling rig in dependence of the kinds of holes that are to be drilled. The flushing system is then, prior to the drilling of a hole, manually set to a suitable flush power. The power to be set, therefore, is dependent on length to be drilled, hole size and steel diameter. This flush power, which is set prior to drilling, is maintained throughout the drilling process.

It is clear from the disclosure of the Tamrock publication, that Tamrock fails to teach, suggest or recognize a method or system for controlling power consumption during drilling, the method and system comprising means for adjusting flush power directly in dependence on a value representing hole depth during a rock drilling process as disclosed by Applicant and expressly recited in independent claims 1 and 11. Adjusting the flush power during drilling results in significant advantages not recognized by the Tamrock publication, including the capability of reducing power in flushing to increase power for use in another sub-process, without exceeding a predetermined power consumption level or capability, or reducing fuel consumption of the main power supply.

The Tamrock publication, which establishes a predetermined flush power prior to the drilling process and maintains the preset flush power during the drilling process, fails to teach or suggest adjusting the flush power "during a rock drilling process", as expressly recited in independent claims 1 and 11. In fact, by establishing a predetermined flush power prior to drilling, and maintaining the pre-established flush power during drilling, the Tamrock publication teaches exactly opposite to the method defined by independent claim 1 and the system defined by independent claim 11 in which flush power is adjusted during a rock drilling process.

It is well established that a rejection of a claim as being anticipated by a prior art reference requires the Patent and Trademark Office to establish a strict identity of invention between the rejected claim and a single applied prior art reference. A rejection of a claim as being anticipated by a prior art reference is improper unless the applied prior art reference discloses all features of the claim, as arranged in the claim.

It is clear from the above discussion that there is no strict identity of invention between the Tamrock publication and independent claims 1 and 11, when the Tamrock publication is considered in its entirety, including contrary teachings, and the two independent claims are viewed as a whole.

Moreover, there is no teaching, suggestion, or motivation in the prior art itself, or within the common knowledge of a person of ordinary skill in the relevant art, to modify the disclosure of the Tamrock publication in any manner rendering independent claims 1 and 11 obvious. As noted above, the Tamrock publication teaches directly against a significant feature of the invention defined by independent claims 1 and 11, namely, that the flush power is adjusted during a rock drilling process.

Applicant respectfully submits that independent claims 1 and 11 are allowable over the Tamrock publication for the reasons discussed above.

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In addition to the differences between independent claims 1 and 11 and the Tamrock publication discussed above, Applicant also submits that the Tamrock publication does not teach or suggest controlling the power consumption of each sub-process simultaneously. The Examiner concedes this at page 3, first paragraph of the Official Action, but contends that controlling the power consumption of each sub-process simultaneously would be considered to be "a matter of design choice". Applicant respectfully disagrees with this conclusion for several different reasons.

In the first instance, a rejection of a claim on the grounds that it is "a matter of design choice" is improper because it is merely conclusory in nature without providing facts or evidence in support of the conclusion. See, for example, In re Dembiczak, 50 USPQ2d 1614 (Fed. Cir. 1999).

Additionally, the Tamrock publication merely discusses, in very general terms, that percussion power, feed force and rotational speed should not be too high or too low. Other than that, the Tamrock publication fails to teach or suggest controlling sub-processes simultaneously to control power. Accordingly, the recitation in each of independent claims 1 and 11 of "controlling the flush power and at least one of the percussion power and rotational power such that total power consumption of each sub-process is controlled", is not taught or suggested by the Tamrock publication.

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For the reasons discussed herein, Applicant respectfully submits that both independent claims 1 and 11 are allowable over the Tamrock publication. The remaining rejected dependent claims, which depend directly or indirectly from independent claim 1 or 11, are allowable, at least for the same reasons as their respective parent independent claim.

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Applicant respectfully submits that this patent application is in condition for allowance,  
and favorable action is respectfully requested.

Respectfully submitted,



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